PLATE 119. Fig. E. *L. trichogonum* Blake. 1, portion of flowering branchlet, × 1¼; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from type (*Blake* 5624).

Fig. F. *L. obtusilobum* Blake. 1, flowering branchlet, × 2; 2, fruiting calyx, ×9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from type (*Chapman*).

Fig. G. *L. californicum* (Boiss.) Heller. 1, spike, × 2; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from fragments of cotype (*Sinclair*) in Gray Herb., except fig. 1 which is from *Baker* 1516.

Fig. H. *L. limbatum* Small. 1, spike, × 1½; 2, fruiting calyx, × 9; 3, outermost bractlet, × 9; 4, innermost bractlet, × 9. Drawn from cotype collection (*Wooton* 172).

DISCOVERY OF PRUNUS CUNEATA IN SOUTHERN NEW JERSEY.

BAYARD LONG.

DR. WITMER STONE'S *The Plants of Southern New Jersey* [1] bears a significant subtitle which must not be overlooked — *with Especial Reference to the Flora of the Pine Barrens.* His work was originally intended as a study of the Pine Barrens alone but upon the persuasion of the authorities of the New Jersey State Museum it was later enlarged to include the whole of southern New Jersey.

Of the life-areas of the southern part of the state, it is to be recalled that there may be recognized, besides the *Pine Barrens* and a *Maritime* region, the *Middle District* of West Jersey and the recently discovered *Coast Strip* [2] on the eastern edge of the Pine Barrens. (The *Cape May District* of Stone is really a complex of all the other areas.) It was well recognized at the time of publication that the original work done upon the Middle District and the Coast Strip was incomparably meager to that done upon the Pine Barrens. Many more species, it was felt, would be added in time to the Middle District flora, while the Coast Strip had been so slightly touched and so little systematized work done upon it, throughout its length, that its exploration was really only

[1] Ann. Rep. N. J. State Mus. 1910, 23–828 (1912).

[2] See Stone, Proc. Acad. Nat. Sci. Phila. 1907, 452 (1908) and Bartonia, i. 20 (1909).

begun. Much time had been spent upon the Pine Barrens, however, and it was hoped that its plant life had been worked out with a fair degree of completeness. Though a number of species, having a general distribution in the Middle District, have been shown to have an occurrence, or a wider distribution, in the Pine Barrens than was originally supposed, this hope has been in large measure realized. In fact no species of any particular significance, so far as I am aware, has been added to the Pine Barren flora until during the past summer. The discovery in the "Pines" of an apparently indigenous species, heretofore unknown in southern New Jersey, is therefore of some interest to at least the local botany of the region.

On July 10, 1915, on the middle eastern edge of the Pine Barrens, I was hurrying over the supposedly quite uniform dry pine woods in order to spend the time more advantageously at interlying bogs and streams, between two obscure flag-stations on the Tuckerton Railroad called Waretown Junction and Lacy. I had been seeing so frequently the low bushes of Black Chokeberry, *Aronia melanocarpa*, in immature fruit, that my casual glance had almost passed some similar little shrubs, when their dark fruit and pale foliage stirred a recollection of sand-plain New England, and I found myself standing on the edge of a colony of *Prunus cuneata*, in abundant ripe and green fruit.

The locality is southeast of Lacy on the North Branch of Forked River where it crosses the Tuckerton Railroad. At the summit of the deep railroad cut through the rise of ground immediately southeast of the Branch it appears to be most abundant, thriving in the regulation dry, sandy, scrubby growth of the Pine Barrens, among Sweet Fern, Black Huckleberry, Low Blueberry, Scrub Oaks, etc. Some of the plants are on the very edge of the cut with the long, stocky roots exposed in the sliding yellow gravel, but most of them are some distance back in the thin, open scrub-growth.

This general region is rather subject to forest fires and the railroad right-of-way is kept well cleared. Much of the shrubbery has suffered from the scythe and the low habit of some of the *Prunus* plants appears to be due to this chance pruning. Further northwest, on the gravel fill connecting the bridge over the North Branch, the plant is again frequent. It is here much taller and more luxuriant, becoming a foot or more in height with tall rank shoots of the year and large leaves.

This fact of the plant being frequent on the transported soil of the gravel fill does not argue its introduction into southern New Jersey by the railroad, it appears to me, but represents only another example of the very common occurrence of native plants which are carried along with transported soil, and find the loose, well-drained, semi-cleared gravel embankments of the railroads a very favorable place for luxuriant growth. In this present case of very local introduction, the gravel used in building this fill, I think, without much need of question, came from the nearby cut. Although the fill stands upon a cleared cedar swamp bordering the stream, its slopes bear a vigorous growth of numerous dry ground native species: *Andropogon scoparium, Aronia melanocarpa, Neopieris mariana, Vaccinium vacillans, Aster spectabilis, Aster gracilis* — all of which could without doubt be found in natural habitats in the immediate neighborhood. With this association of species occurs *Prunus cuneata* on the fill. I think there need be no hesitation in believing that it was derived from the colony at the summit of the nearby slope.

Native species which are commonly recognized as weeds, or are well known as likely of introduction; species in cultivation or wild species whose fruits are collected and shipped to the market — these, and plants of numerous other categories, are always open to suspicion when they are credited as being native in a botanically well known region where previously unrecorded. The common occurrence of peaches, pears, apples in natural habitats in New Jersey offers no problem to the field botanist, but the presence of certain species of blackberries, strawberries, or blueberries along railroads in districts where small fruits are grown or collected is to be looked upon as a very different case.

As regards the possibility of introduction of *Prunus cuneata*, however, the chances seem rather slight: —

It is a plant of somewhat restricted distribution, commonly recorded from habitats which bear little or no close relation to lands subject to cultivation. I have found no published records of the species ever occurring as an introduction, and with the exception of a locality brought to my attention in conversation with Mr. K. K. Mackenzie, it appears to be known from only wild and undisturbed areas. In a recent letter Mr. Mackenzie describes this occurrence of *Prunus cuneata* as "a few bushes, possibly six, near a place called Wortendyke, north of Paterson, New Jersey. These bushes were at the edge of a

plowed field — between the edge of the field and the fence. The soil was rather sandy and in the immediate vicinity was a good deal of scrub oak with small openings between. I, however, found no other specimens of *Prunus*. Hence I have often doubted whether it was native in this particular locality." But, as he says further on, in general comment, "whether *Prunus cuneata* is native or not at any particular location would have to be decided by a consideration of all factors involved," and no doubt arguments could be advanced on the possibility of this being a really indigenous colony.— The species is not known in the immediate vicinity of this new locality at Lacy, while the nearest well known stations are along the coast of Connecticut, the Highlands of the Hudson, the summits or upper slopes of the Kittatinny Mountains of northern New Jersey and eastern Pennsylvania, and very locally in Lancaster County, Pennsylvania — a distance averaging nearly a hundred miles. Distance always removes certain possibilities of chance introduction, but on the other hand a distance of a hundred miles is not at all to be construed as too far removed for the outposts of a natural distribution. There are too many well known cases of even greater distances between outlying stations to require specific comment.— The fruit is scarcely palatable and does not seem to be collected. L. H. Bailey says: "Not in the trade, so far as known." [1] and W. F. Wight in his comprehensive treatment of *Native American Species of Prunus* states: "It has apparently not been utilized in horticulture." [2]

The above facts seem to remove at least some of the more readily possible sources of introduction.

The most interesting evidence, it would seem, of the likelihood of the plant being indigenous on the Coastal Plain of New Jersey is furnished by its well known occurrence in the sand-plain region of New England. Until the summer of 1913 I had been familiar with the species only on rocky slopes and summits of the Poconos and Kittatinnies. When botanizing with Prof. M. L. Fernald in eastern Massachusetts, in the town of Lakeville, August 26, 1913, the occurrence of *Prunus cuneata* in the flat, sandy region of Plymouth County was greeted by me with some surprise, but I was assured that this was not an unusual species of this area. Several days later the plant was seen again in Plymouth County in a habitat very similar, as I recall it

[1] Bailey, Cycl. Am. Hort. 1451 (1901).
[2] Wight, U. S. Dept. Agr. Bull. No. 179. 67 (1915).

now, to that at Lacy, New Jersey — a dry,[1] open, sandy, undulating slope, bearing scattered, scrubby thickets, backed by low trees, and descending into a bog along a streamlet.

Prof. Fernald writes me that "in New England the species is emphatically one of the coastal sands and sterile rocky barrens, and we should not expect to see it elsewhere. All of our material comes from the southern tier of states or from the sand-plain areas of the interior extending inland and northward to the sands about Lake Champlain, the sandy shores (along with *Hudsonia*, *Polygonella* &c.) of the Winnepesaukee and Ossipee region and the sandy plains of southwestern Maine, as well as the sand-plain of the Housatonic and Connecticut valleys."

Dr. N. L. Britton, in two papers on the flora of the Kittatinny Mountains, in calling attention to the existence there of sand-plain types, many years ago recognized this species as a sand-loving plant, and although at that time supposing it to be conspecific with *Prunus pumila*, which is "more commonly found on sandy river shores, though not a coastal plant," [2] he nevertheless associated it, and quite correctly, as a further knowledge of our Coastal Plain flora has shown, with "plants whose ordinary habitat is in sandy soil near the Atlantic Coast." [2]

That this little Sand Cherry is frequent in the sand-plain areas of New England and very rare in southern New Jersey may possibly be a case parallel in some measure to the abundance of such species as *Sabatia dodecandra*, *Coreopsis rosea*, *Chrysopsis falcata* in the New England areas having a Coastal Plain flora, and their comparative infrequence in south Jersey! — not a case of plants of similar distribution but plants which are definitely sand-loving and might be supposed to occur in increased abundance in the extensive sands of the Coastal Plain.

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[1] The rather frequent insistence, in manuals and floras, of a moist rather than a dryish habitat is perhaps worthy of comment. This may be correct, without doubt, for some portions of the range, possibly to the northwestward. But, though there is sometimes "sandy," "rocky," "or among rocks" included, frequently the habitat noted does not very satisfactorily describe the usually dry, sandy, sterile or rocky situation in which the plant commonly occurs in the east. In the volumes used in daily reference we find the species recorded from "moist, sometimes rocky soil or meadows," "wet soil," "bogs and other cool land," "near lakes and about bogs or other moist situations."

[2] Britton, Bull. Torr. Bot. Cl. xiv. 187 (1887).